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BASE REALIGNMENT AND CLOSURE PLAN CNC CHARLESTON SC  
3/1/1997  
NAVFAC SOUTHERN

**Department of the Navy**

# **Base Realignment and Closure Business Plan**



For  
**Naval Base, Charleston, SC**  
-Naval Station  
-Naval Shipyard  
-Fleet Industrial  
Supply Center

**Department of the Navy**

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# **Base Realignment and Closure Business Plan**



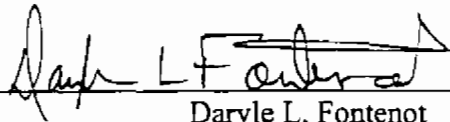
**For  
Naval Base, Charleston, SC**

March 1997

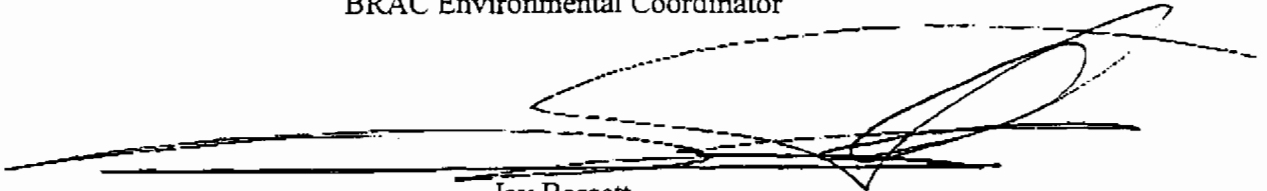
**NAVAL BASE CHARLESTON  
CHARLESTON, SOUTH CAROLINA**

**BASE REALIGNMENT AND CLOSURE  
(BRAC) BUSINESS PLAN**

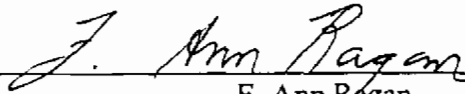
The purpose of the BRAC Business Plan is to present the environmental restoration status, strategies and goals pertaining to the cleanup of Naval Base Charleston. The BRAC Cleanup Team (Daryle Fontenot, Jay Bassett, and Ann Ragan) has concurrently developed this "Business Plan".



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MARCH 1997

## ***BASE REALIGNMENT AND CLOSURE BUSINESS PLAN***

### **REUSE PLAN AND ENVIRONMENTAL PROGRAMS RELATIONSHIP**

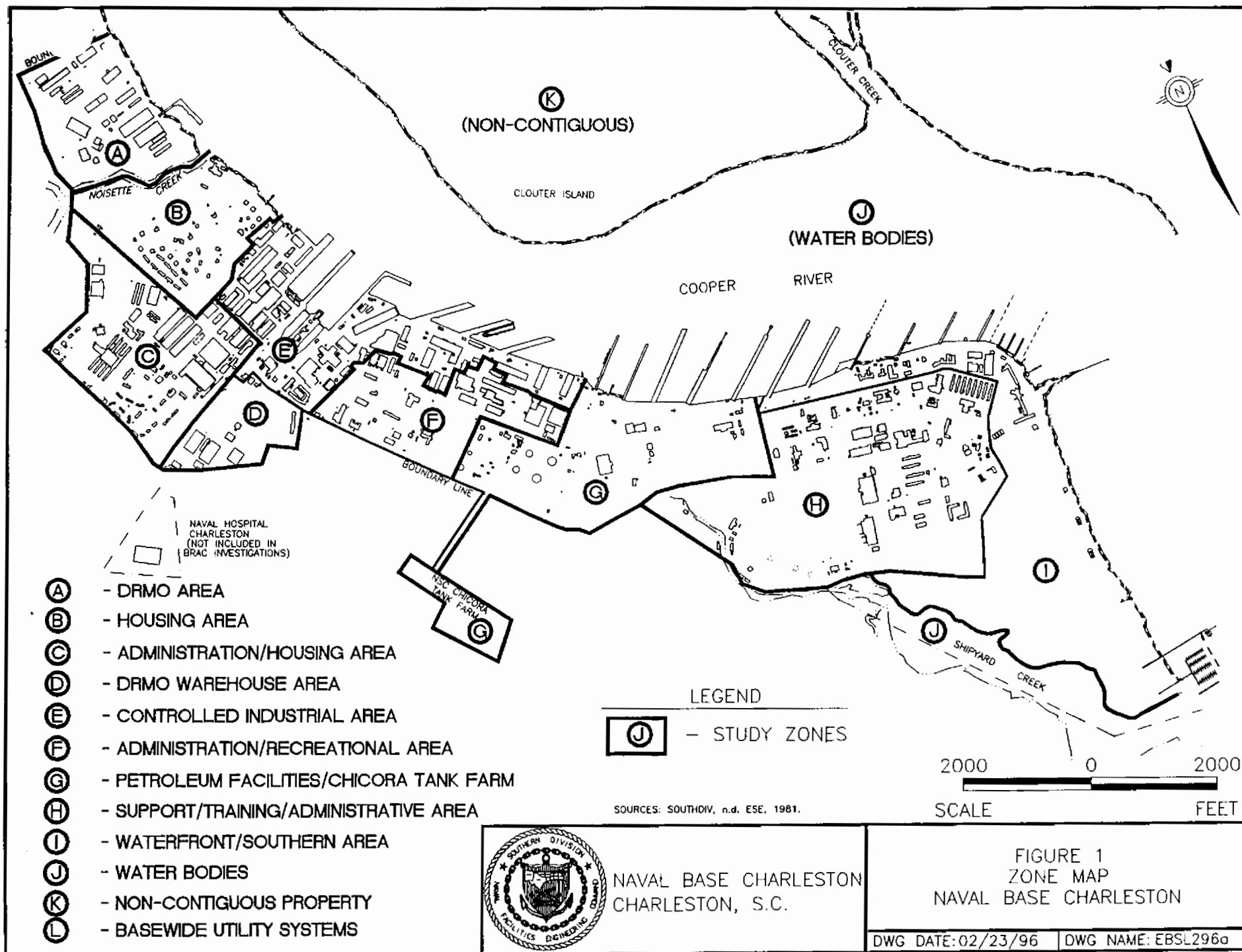
The Reuse Plan for Naval Base Charleston prepared by the Redevelopment Authority (RDA) is divided into three reuse scenarios. One scenario divides the base into five districts: an Office District, Shipyard District, Marine Industrial District, new Class A Industrial Park and an intermodal cargo port district. The second scenario has an Office District, Shipyard District, Marine Industrial District, new Class A Industrial Park and an intermodal cargo district with the Marine Industrial Park, Cargo Terminal, and Intermodal Rail Yard locations being modified to avoid existing wetlands, contaminated areas, and the existing vegetated buffer along Shipyard Creek. The third scenario is to reuse and expand the existing shipyard facilities at the base by private enterprise, through the development of maritime facilities intended to support shipyard activities. In addition to the shipyard and maritime industrial districts, the alternative proposed an office district, cultural park district, community support districts, and area designated for open space and active recreation. The base reuse plan is a living document which is modified based upon ongoing mission requirements. The Environmental Impact Statement (EIS) for disposal and reuse of Naval Base Charleston has been prepared with a Record of Decision having been issued on 7 May 1996.

The RDA is preparing a Feasibility / Business / Operation / Development Plan to support their Economic Development Conveyance Application. This "Business" Plan should be completed by September 1997.

The RCRA Facility Investigation of Naval Base Charleston involves the investigation of 400 sites and was divided into twelve investigative zones which encompass the entire area of the base, as well as the non-contiguous properties. To date 188 of the original 400 RCRA sites have been declared No Further Action (NFA) sites. The zones were established based on areas with similar contaminants or similar type of activity having occurred, areas small enough to manage, areas based upon existing geographical features, areas that can be investigated quickly, and areas of significant community interest. The zones are labeled A through L as shown in Figure 1.

The strategy for sequencing the investigation of the twelve zones involved prioritizing the zones based on potential reuse with the Restoration Advisory Board's (RAB) agreement. The framework for the strategy can be seen in Figure 2. The dates included in Figure 2 are included in the Corrective Action Management Plan (CAMP). The CAMP identifies regulatory dates that must be met by the Navy.

The first zone investigated was Zone H which included the property transferred to the State Department. Zone H was given first priority as the request of the Redevelopment Authority because of the planned container port. The Zone H RFI Report is currently awaiting approval by South Carolina DHEC. The investigations for Zones C and I were started next. Zone I contains the property transferred to the National Oceanographic and Atmospheric Administration (NOAA). The RFI reports for Zones C and I are also awaiting approval by South Carolina DHEC. The investigation of Zone E started after Zones C and I. It is anticipated that Zone E



# NAVAL BASE CHARLESTON

## RCRA FACILITY INVESTIGATION PROJECT SCHEDULE

		CURRENT	PLANNED				CORRECTIVE	CORRECTIVE	CORRECTIVE
		RFI	COMPLETION		OVERALL	OVERALL	MEASURES	MEASURES	MEASURES
	CURRENT	PHASE	DATE OF		RFI	RFI	STUDY	STUDY	IMPLEMENTATION
	RFI	COMPLETION	CURRENT RFI	NEXT	COMPLETION	COMPLETION	START	COMPLETION	START
ZONES	PHASE	PERCENTAGE	PHASE	PHASE	DATE	PERCENTAGE	DATE	DATE	DATE
A	Report Review	95	2/18/97	CMS Work Plan	2/18/97	95	4/8/97	11/17/98	Mar-99
B	Report Review	100	12/20/96	CMS Work Plan	1/8/97	100	2/11/97	4/21/98	Sep-98
C	Report Review	80	3/21/97	CMS Work Plan	3/21/97	90	5/14/97	9/15/98	Jan-99
D	RFI Report Prep	60	3/15/97	Report Review	6/6/97	65	8/12/97	11/17/98	Mar-99
E	Field Work	99	2/24/97	RFI Report Prep	8/19/97	50	10/14/97	5/18/99	Oct-99
F	Field Work	90	3/15/97	RFI Report Prep	9/16/97	45	10/14/97	4/20/99	Sep-99
G	Field Work	90	3/15/97	RFI Report Prep	9/26/97	45	10/14/97	4/20/99	Sep-99
H	Report Review	95	1/31/97	CMS Work Plan	1/31/97	95	4/14/97	8/18/98	Dec-98
I	Report Review	50	4/16/97	CMS Work Plan	4/16/97	80	6/10/97	10/20/98	Jan-99
J	Field Work	0	10/16/97	RFI Report Prep	4/21/98	10	6/10/98	10/19/98	Mar-00
K	Field Work	90	3/16/97	RFI Report Prep	9/30/97	45	10/14/97	4/20/99	Sep-99
L	Field Work	0	8/2/97	RFI Report Prep	1/21/98	10	3/10/98	7/20/99	Dec-99
All Zones					4/21/98	60			

LEGEND	
Phase	Description
RFI	RCRA Facility Investigation
CMS	Corrective Measures Study
CMI	Corrective Measures Implementation
Work Plan Preparation	Work Plan being prepared by Navy Contractor
Work Plan Review	Regulators (DHEC & EPA) reviewing work plan
Field Work	Navy contractor performing field work as outlined in the Work Plan
RFI Report Preparation	Navy contractor preparing the RFI Report
Report Review	Regulators (DHEC & EPA) reviewing report
CMS Work Plan	CMS Work Plan being prepared by Navy Contractor

will be the most difficult to remediate because of the highly industrial activities. Zone E also is the area which offers the greatest potential for reuse and job creation. To date the shipyard area of the Naval Base has been the most active area for leasing and lease request on the base. Zones A and B investigations were started next. The Zone A RFI report is awaiting approval by South Carolina DHEC and the RFI Report for Zone B has been approved by the regulators and was the first RFI report finalized. Zone B is now in the Corrective Measures Study phase of the RCRA cleanup process. The investigations of Zones D, F, G and K is underway at this time and there should be RFI reports submitted for regulatory review for all of these zones by mid May 1997. The Zone J and L investigations are scheduled to start in the first part of 1997. These zones involve the investigation of the water born areas of the base, the sanitary sewer system, the storm sewer system and railroad system on the base. The Zone J and L RFI reports should be submitted to the regulators for review by the first part of 1998 and the end of 1997 respectively.

Other environmental programs being addressed for the cleanup of the Naval Base include asbestos, lead based paint, underground and aboveground storage tanks, general radioactive material (G-RAM), and Naval Nuclear Propulsion Program (NNPP) radioactive materials. All of these programs must be addressed along with the RCRA investigation to cleanup and transfer the base.

Friable and accessible asbestos is being remediated as buildings are being closed and/or leased to the RDA. Currently, an asbestos remediation project is underway at Building 32 and is scheduled to be complete by the end of June 1997.

To manage the underground and aboveground storage tanks at the base, a Tank Management Plan has been prepared. The plan has outlined the strategy being used to address the disposition of over 160 tanks that are not needed for reuse of the base. Removal of tanks started in April 1996 and to date, 85 tanks have been removed with assessment and remediation of contaminated sites to start next. To address contaminated tank sites that will need to be remediated, a Petroleum Remediation Plan is also being prepared to layout a strategy to address those tank sites.

Lead based paint abatement has started in a few of the historical housing units needed for reuse by the Redevelopment Authority. Additional lead based paint abatement projects in the housing area are in the planning stages.

Facilities at Naval Base Charleston have been radiologically surveyed and released for unrestricted use in accordance with the Charleston Naval Shipyard NNPP and G-RAM Survey Plan prior to being made available for reuse. The entire naval base complex has been released from radiological controls.

The schedule for accomplishing the cleanup involved in the asbestos, lead based paint, underground and aboveground storage tank programs will coincide with the RFI project schedule (See Figure 2.) so that all environmental programs that require cleanup will be completed around the same time according to zones (as much as possible), so the property can be transferred as soon as possible.



In order to make available facilities for reuse to the RDA as soon as possible and before transfer of the facilities can take place, Findings of Suitability to Lease (FOSL) and Environmental Baseline Survey for Lease (EBSL) have been prepared for over 700 facilities (95% of the usable buildings) to date on the Naval Base. This has allowed the RDA to enter into interim lease agreements with companies for reuse of Naval Base facilities.

The environmental condition of property at Naval Base Charleston determines which parcels are environmental suitable for transfer to the community. Based on the environmental condition of the property determined by the Environmental Baseline Survey and other environmental investigations of the property, the Naval Base property has been divided into seven categories which relate to the transferability of the property. Property in categories 1 through 4 are eligible for deed transfer under CERCLA, as amended. Properties in categories 5 and 6 may be considered for transfer upon concurrence with the State and EPA in accordance with CERCLA 120(h)(3)(C). The environmental condition of property of the 2880 acres at Naval Base Charleston is as follows.

<u>Classification</u>	<u>Acreage</u>
1 / White	0
2 / Blue	0
3 / Light Green	1389
4 / Dark Green	0
5 / Yellow	126
6 / Red	397
7 / Gray	968

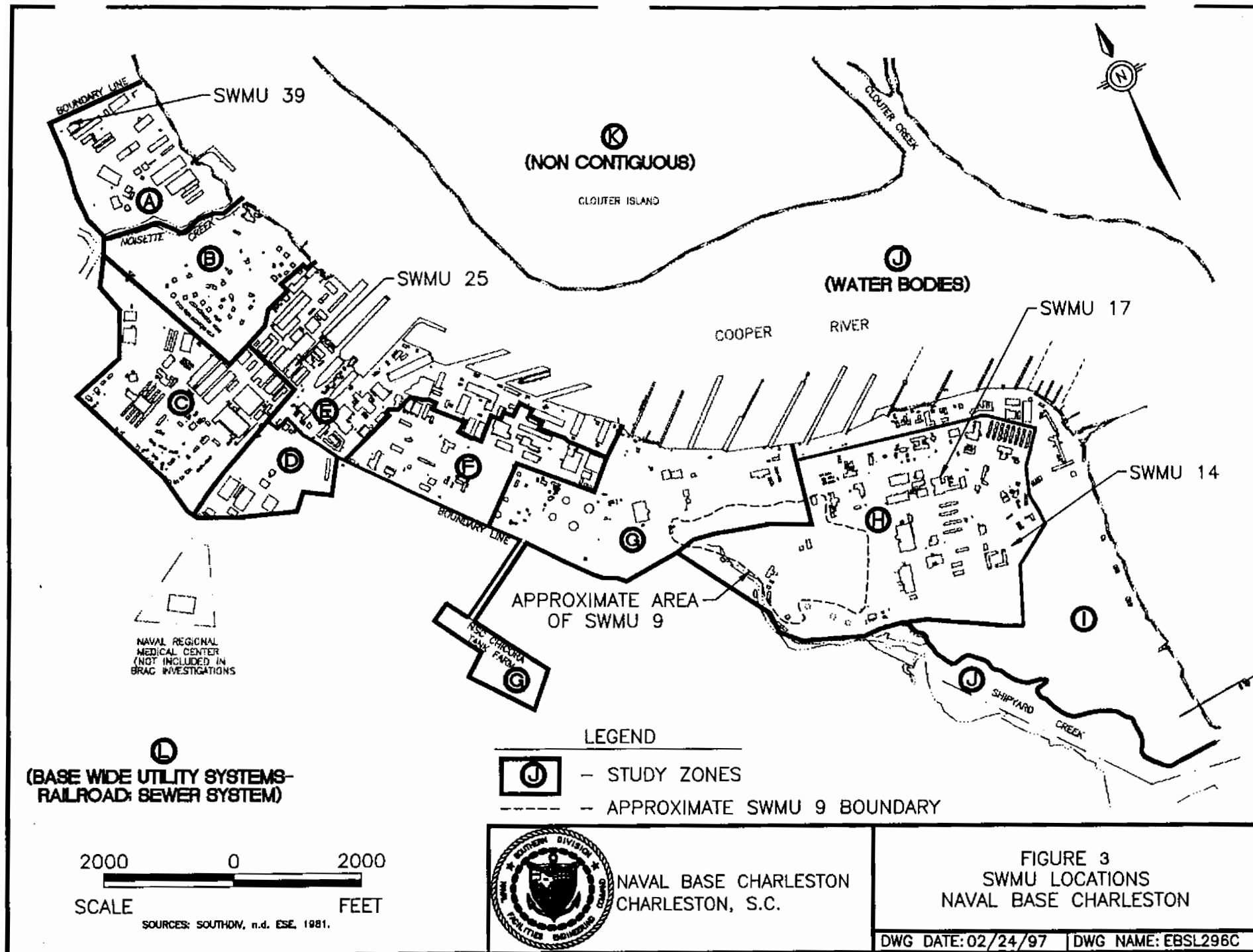
The category 3 property of 1389 acres (Clouter Island dredge spoil area) has been transferred to the United States Army Corps of Engineers.

## **ENVIRONMENTAL SITE DISCUSSION**

The following is a discussion of what the BCT thought are five of the top environmental sites of concern at Naval Base Charleston. The information available on the sites to be discussed is draft and since field data is still coming in on sites at Naval Base Charleston, the list is subject to change. The information presented on the results of the investigations covering the first three sites was obtained from the Zone H RFI Report, which is currently being reviewed by the regulators and not a final document. Figure 3 shows the location of the sites to be discussed.

### **Solid Waste Management Unit (SWMU) 9**

SWMU 9 is a closed landfill at the southeast end of the Naval Base (See Figure 3.). The former landfill portion of SWMU 9 is open with few paved or capped areas to prevent rainwater infiltration. The landfill cap, where present, is typically sand with a low percentage of clay. SWMUs 19, 20 and 121 along with Areas of Concern (AOCs) 649, 650, 651 and 654 are in the SWMU 9 boundary which are a solid waste transfer station, a waste disposal area for industrial



materials, a former satellite accumulation area now associated with a recycling operation, areas formerly used to store ship repair supplies and the location of a former septic tank disposal system respectively.

Surface soil contaminants of concern are Aroclor-1254 and 1260, benzo(a)pyrene equivalents, arsenic, beryllium, copper, nickel and zinc. The incremental lifetime excess cancer risk (ILCR) for the above contaminants was calculated to be  $7E-5$  and the hazard index (HI) was calculated to be 3.

Shallow groundwater contaminants of concern are benzidine, chlorinated benzenes, chlorinated alkanes/alkenes, arsenic, dioxins, alkylphenols, aromatics and antimony. The ILCR for the above contaminants was calculated to be  $1E-1$  and  $2E-3$  for the first and second quarter sampling respectively and the HI was calculated to be 22 and 11 for the first and second quarter sampling respectively. Dioxin (2,3,7,8-TCDD equivalent) was detected in the shallow groundwater above levels of concern in the amount of 1.585 - 2.798 picogram per liter.

Deep groundwater contaminants of concern are thallium, chloroform, carbon disulfide and manganese. The ILCR for the above contaminants was calculated to be  $4E-6$  and the HI for the first and second quarter sampling was calculated to be 138 and 17 respectively.

A cleanup technology has not been selected for SWMU 9. The cleanup technologies being considered for this site include containment by capping; excavation and ex-situ treatment with off/on site disposal (high temperature thermal desorption, incineration, soil washing, and bioremediation); in-situ bioremediation; extraction and chemical treatment (chemical precipitation, UV/ozone, air or steam strip VOCs); intrinsic remediation; containment; monitoring; and no action. A presumptive remedy is being considered for this site.

#### Solid Waste Management Unit (SWMU) 14

SWMU 14 is a flat, open, vegetated site which served as a chemical disposal area for miscellaneous chemicals, warfare decontaminating agents, and possibly industrial wastes. A small drainage ditch originates in SWMU 14 and runs southeast toward the dredged material area (See Figure 3.). SWMU 15 and AOCs 670 and 684 are within the SWMU 14 boundary which are a former propane fired incinerator for classified documents, a former outdoor trap and skeet range and a former outdoor pistol range respectively.

Surface soil contaminants of concern include aluminum, arsenic, benzo(a)pyrene equivalents, beryllium, vanadium, thallium, antimony and total petroleum hydrocarbons. The ILCR for the above mentioned contaminants was calculated to be in a range from  $1E-4$  -  $7E-5$ . The HI for the above mentioned contaminants ranged from 1 to 2. The total petroleum hydrocarbons were present above the cut off of 100 parts per million action level at the site at a maximum detected concentration of 13,400 parts per million.

Shallow groundwater contaminants of concern include bis(2-ethylhexy)phthalate; 2,3,7,8 TCDD equivalents (dioxin); aluminum; and vanadium. The ILCR for the above mentioned

contaminants was calculated to be  $3E-5$  and have a HI of 2. Dioxin was found in the shallow groundwater above the level of concern in the concentrations of 2.038-11.368 picogram per liter.

Deep groundwater contaminants of concern include heptachlor epoxide,; 2,3,7,8-TCDD equivalents, chloroform, cadmium; and thallium. The ILCR for the above mentioned contaminants was calculated to be  $5E-4$  and have a HI of 17. Dioxin was found in the deep groundwater above levels of concern in the concentrations of 1.061-2.285 picogram per liter.

The cleanup technology for this site has not been selected. The cleanup technologies being considered for this site include extraction; chemical precipitation of metals; air or steam stripping; monitoring; intrinsic remediation; and no action.

#### Solid Waste Management Unit (SWMU) 17

SWMU 17 is the site of a ruptured underground fuel pipe that ruptured beneath Building FBM 61 in 1987 and was subsequently corrected (See Figure 3.). This released approximately 14,000 gallons of fuel oil beneath the north-central extension of the building. The area where the release occurred, to the north and west of the former building, is capped with asphalt and concrete. The area east of the building extension is unpaved and grassy. Soil sampling identified the presence of SVOCs and PCBs in the soil adjacent to the building.

Surface soil contaminants of concern include benzo(a)pyrene equivalents and Aroclor-1260. The ILCR for the above mentioned contaminants was calculated to be  $4E-4$ . The total petroleum hydrocarbons were present above the cut off of 100 parts per million action level at the site at a maximum detected concentration of 1,200 parts per million.

Shallow groundwater contaminants of concern include bensidine and mono, di and tri chlorobenzenes. The ILCR for the above mentioned contaminants was calculated to be  $1E-1$ .

Deep groundwater was found to be uncontaminated.

The cleanup technology for this site has not been selected. The cleanup technologies being considered for this site include containment by cap; extraction; solidification; thermal destruction; chemical destruction; chemical oxidation (UV/ozone); dechlorination; monitoring; intrinsic remediation; and no action.

#### Solid Waste Management Units (SWMUs) 22 and 25

SWMU 22 is the old plating shop wastewater treatment system and SWMU 25 is the old plating shop (Building 44) operation (See Figure 3.). These two sites along with AOC 554 (former Building 1003 paint shop) are located in the controlled industrial area of the shipyard and are being investigated together due to their proximity and the similarity in materials likely present. The wastewater treatment system being investigated under SWMU 22 consisted of a concrete collection sump portioned in half. One side accumulated acidic wastewater while the other side collected cyanide and alkaline wastewater. Treatment effluent was discharged to the sanitary

sewer. SWMU 25 is located in the southwestern portion of Building 44, which housed an electroplating operation that was operational until 1993. The facility contained 40 metal tanks that contained solutions used in the plating process. The concrete floor shows signs of deterioration.

The materials that were stored or generated at these sites included chromic acid, cadmium, copper, chromium, lead, nickel, silver, mercury, cyanide, barium, waste paint, paint thinner, solvents and heavy metals. The RFI investigation of SWMUs 22 and 25 and AOC 554 is currently being performed as part of the Zone E RFI investigation. Previous investigations have identified contaminants such as volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and inorganics. Mercury is an analyte that is known to have been present at these facilities and is of particular concern in Building 44, where air circulation is restricted.

Risk is not known at this time since the investigation has not been completed, but there appears to be contamination of groundwater and soil, along with air contamination concerns in Building 44. Cleanup technologies will not be selected until the extent and nature of the contamination has been defined. The Zone E RFI report is not scheduled to be submitted to the regulators until May 1997. Currently the old plating shop area is being demolished as part of the completion of the process closure of the facility.

#### Solid Waste Management Unit (SWMU) 39

SWMU 39 is the site of a former storage area for petroleum, oil, and lubricants (POL) drums north of Building 1604, near the northern boundary of the base (See Figure 3.). There is an oil storage tank farm adjacent to this boundary and was included in the assessment of the site due to potential petroleum releases from offsite tanks.

The initial soil investigation results for SWMU 39 indicated the presence of TPH, Aroclor-1260 and SVOC (carcinogenic polynuclear aromatic hydrocarbons) contamination at the site. Additional soil investigation results indicated that SVOC contamination in the soil exceeded risk based concentrations (RBCs) in only on upper interval sample and Aroclor-1260 exceeded the RBC in three upper interval samples, generally located in a close proximity along the northern base property line. TPH detection's were wide spread in the area of SWMU 39, but elevated concentrations of individual constituents associated with TPH (BTEX and naphthalene) were not found.

The initial groundwater investigation of SWMU 39 indicated that two groups of VOC constituents warranted further investigation, BTEX and chlorinated solvents. Dense Nonaqueous Phase Liquids (DNAPL) were encountered in one monitoring well located near Building 1604 during the initial sampling. The constituents of concern that warranted additional investigation were chlorinated solvents, including: cis-1,2 dichloroethene (DCE), trichloroethene (TCE), tetrachloroethene (PCE), and vinyl chloride. Analysis of the data collected from the additional groundwater investigation indicated a plume of chlorinated solvents in the general vicinity of Buildings 1604, 1605 and 1607 and contaminate levels as high as 509 µg/L of DCE, 141 µg/l of TCE, 23 µg/L PCE, 110 µg/L of vinyl chloride, 92 µg/L of benzene, . The groundwater flow

direction is toward the northwest boundary of the base, which is bounded by a marsh and an apartment complex.

To verify if chlorinated solvents have left the base, an investigation of the adjacent community was done using direct push technology. The offbase investigation did not indicate that chlorinated solvents have left the base property. Several permanent monitoring wells were installed offbase for additional information and future monitoring.

Free phase petroleum product was discovered in the northern most corner of the base property adjacent to the tank farm. Groundwater flow in this area is onto the base from the adjacent property. It was discovered that the adjacent property has had a release of petroleum products to the soil and groundwater. The adjacent property owner is conducting an investigation of the tank farm release. The Navy and the adjacent property owner are cooperating in the investigation of the petroleum release. The petroleum release is not the responsibility of the Navy.

The investigation of SWMU 39 should be completed by the end of May 1997. Risk is not known at this time since the investigation is not complete. Cleanup technology recommendations will be included in the report submitted to the regulators for review in May of 1997.

## **MAJOR EXECUTION ISSUES**

### **Timely Funding**

Without BRAC funding being available when needed, the execution of the cleanup of the base according to the agreed upon schedule with the regulators will be jeopardized. The unfunded amounts of the budget will begin to become more and more critical that they become funded the further we get into remediation of sites on the base. Without the funding of the unfunded amounts in the budget projections, clean transfer or dirty transfer of base property cannot take place. This will delay transfer of the base property and may hinder the RDA in attracting the type of companies willing to make major capital investments in the Naval Base property.

### **Defense and State Memorandum of Agreement (DSMOA) Grant for SCDHEC**

SCDHEC has indicated that the level of DSMOA funding is not sufficient to provide for all of the necessary technical support required by them for the Naval Base Charleston project. The funding to the state was increased by one full time position for Naval Base Charleston in 1996. There is still some question if this is enough to maintain the project schedule for Naval Base Charleston. Additional DSMOA funding may be needed to insure that SCDHEC can adequately support the Naval Base Charleston project in a timely manner.

### Finding of Suitability to Lease (FOSL)/Environmental Baseline Survey for Lease (EBSL)

The amount of effort spent by the BCT on reviewing the many FOSLs/EBSLs generated at the request of the Redevelopment Authority has hampered the timely review of RFI work plans and reports. Less time needs to be spent by the BCT on the FOSLs/EBSLs and more time on the RFI process and the other environmental programs if the base is to be cleaned up and transferred. The effort spent by the BCT to make sure the Navy stays out of the way of reuse has caused the RCRA Facility investigation and cleanup to lag behind schedule along with diverting the BCT's attention from other environmental issues at the base. This should stop being an issue since the remaining facilities requiring a FOSL are few, but it should be recognized as a potential delay in the completion of RFI work in the future.

### Charleston Environmental Detachment

The Detachment is important in two ways. It is employing former Charleston Naval Shipyard workers and providing the Navy with an in-house cleanup resource that is being put to work much faster than a normal contractor. This has allowed for the cleanup work to be completed faster, which relates to a potentially quicker transfer of property to the community. Projects and funding must be provided to the Detachment in a timely fashion for this to happen. Currently, the Detachment is working on asbestos abatement projects, lead based paint abatement projects, interim measures projects (22 projects assigned and working or completed to date), tank removal projects (85 tanks removed to date). The Detachment started working on 1 April 1996.

### PROGRAM REDUCTIONS/SAVINGS DUE TO BCT INITIATIVES/DECISIONS

The decision by the BCT to divide the base into twelve investigative zones has large savings potential. The zone approach has allowed the investigation to concentrate on smaller areas, thus making the investigation of Naval Base Charleston more manageable. This will also allow for individual zone investigations to be completed and the transfer of property to the community, determined to be clean, to take place before the entire base investigation is complete.

The use of the Charleston Environmental Detachment to perform cleanup actions at Naval Base Charleston has provided for a reduction in time and funds needed to complete a cleanup action. The time and funding savings come from not having to go through long contract negotiations required to get a regular environmental contractor on-line to perform cleanup work.

The inclusion of the regulators in the decision making process involving the generation of documents in lieu of waiting and getting regulatory input through comments has improved the quality of our documents and has provided a time savings on the generation of documents.

## **TARGET COMPLETION DATE**

It is anticipated that by March of 2000 that all remedial actions will be initiated at sites requiring cleanup. Also by this time, the majority of the sites under remediation should be working satisfactorily to cleanup the environment as designed, thus allowing for the transfer of the property to the community. This date is obtainable only if funding is received that will fully support our project schedule.

### **Critical Milestones for Accomplishing the Target Completion Date**

- Having the funding available that is needed to accomplish the cleanup as outlined in the Corrective Action Management Plan.
- Completion of the RCRA Facility Investigation by April 1998.
- Agreement on the level of cleanup required at Naval Base Charleston (Residential or Industrial).

## **PRESENT PAYBACK OPPORTUNITIES FOR COMMITMENT OF FUNDING**

- The Charleston Environmental Detachment performing cleanup work at Naval Base Charleston. Cleanup work done faster and cheaper by the Detachment than a contractor.
- Complete funding of the cleanup now will make it possible to get property transferred either under a clean (remediated) or by the criteria outlined under CERFA dirty parcel determination, thus getting the transfer of property to the community faster.
- Funding interim removal actions and presumptive remedies. This will also help in getting to a clean parcel determination faster.